

WHAT IS CLAIMED IS:

- 1 1. A method for obtaining a cyclic redundancy code for a
2 message, comprising:
3 separating the message into a plurality of segments;
4 multiplying a remainder for each segment by a segment-
5 constant based on a generator polynomial to obtain a plurality
6 of segment-remainders;
7 accumulating the segment-remainders to obtain an
8 accumulated-remainder; and
9 moduloing the accumulated-remainder by the generator
10 polynomial to obtain the cyclic redundancy code for the
11 message.
- 1 2. The method of claim 1, further comprising, moduloing the
2 segments by the generator polynomial to obtain the remainder
3 for each segment.
- 1 3. The method of claim 1, further comprising separating the
2 message into three or more segments.
- 1 4. The method of claim 1, wherein the cyclic redundancy code
2 is appended to the message and the appended message is
3 transmitted to a receiver.
- 1 5. The method of claim 1, wherein cyclic redundancy code
2 indicates the existence of an error in the message.
- 1 6. The method of claim 5, wherein integrity of the message
2 is verified if the cyclic redundancy code is zero.

1 7. The method of claim 5, wherein the integrity of the
2 message invalidated if the cyclic redundancy code is non-zero.

1 8. The method of claim 1, wherein moduloing includes
2 dividing by the generator polynomial.

1 9. The method of claim 1, wherein moduloing includes
2 multiplying by a reciprocal-approximator for the generator
3 polynomial.

1 10. The method of claim 1 wherein the segment-constant for
2 each segment is obtained by moduloing the position of the
3 segment in the message by the generator polynomial.

1 11. A device for obtaining a cyclic redundancy code for a
2 message, the message separated into a plurality of segments,
3 comprising:

4 a multiplier to multiply a remainder for each segment by
5 a segment-constant based on a generator polynomial to obtain a
6 plurality of segment-remainders;

7 an accumulator to accumulate the segment-remainders to
8 obtain an accumulated-remainder; and

9 a modulo unit to modulo the accumulated-remainder by the
10 generator polynomial to obtain the cyclic redundancy code for
11 the message.

1 12. The device in claim 11, wherein the device is a network
2 card and the modulo unit includes a plurality of modulo units
3 to modulo the each segment of the message by the generator
4 polynomial to obtain the remainder for each segment.

1 13. The device in claim 11, further comprising a memory for
2 storing a plurality of segment-constants.

1 14. The device in claim 11, wherein the segments constants
2 obtain upon receipt of the message.

1 15. The device in claim 11, wherein the modulo unit divides
2 the accumulated-remainder by the generator polynomial to
3 obtain the cyclic redundancy code.

1 16. The device in claim 11, wherein the modulo unit
2 multiplies the accumulated-remainder by a reciprocal-
3 approximator for the generator polynomial to obtain the cyclic
4 redundancy code.

1 17. A method for determining a cyclic redundancy code,
2 comprising:
3 separating a message into a plurality of segments;
4 multiplying each segment by a segment-constant based on a
5 generator polynomial to obtain a plurality of segment-
6 remainders;
7 accumulating the segment-remainders to obtain an
8 accumulated-remainder; and
9 moduloing the accumulated-remainder by the generator
10 polynomial to obtain the cyclic redundancy code for the
11 message.

1 18. The method of claim 17, where a degree of a most
2 significant bit of the generator polynomial is greater than a
3 degree of a most significant bit of each segment.

1 19. The method of claim 17, comprising separating the message
2 into three or more segments.

1 20. The method of claim 17, wherein the generator polynomial
2 includes a field extender.

1 21. The method of claim 17, wherein cyclic redundancy code
2 indicates a likelihood of an error in the message.

1 22. The method of claim 17, wherein each one the plurality of
2 segment-constants is based on the generator polynomial and the
3 position of the segment in the message.

1 23. A device that obtains a cyclic redundancy code for a
2 message, the message separated into a plurality of segments,
3 comprising:

4 a multiplier to multiply each segment by a segment-
5 constant to obtain a plurality of segment-remainders;

6 an accumulator to accumulate the segment-remainders to
7 obtain an accumulated-remainder for the message; and

8 a modulo unit to modulo the accumulated-remainder by a
9 generator polynomial to obtain the cyclic redundancy code for
10 the message.

1 24. The device in claim 23, further comprising a memory for
2 storing a plurality of segment-constants.

1 25. The device in claim 23, wherein the modulo unit divides
2 the accumulated-remainder by the generator polynomial to
3 obtain the cyclic redundancy code.

1 26. The device in claim 23, wherein the modulo unit
2 multiplies the accumulated-remainder by a reciprocal-
3 approximator for the generator polynomial to obtain the cyclic
4 redundancy code.

1 27. A method for incrementally updating a cyclic redundancy
2 code, comprising:

3 subtracting a prior message from an updated message to
4 obtain a difference;

5 moduloing the difference by a generator polynomial to
6 obtain a remainder; and

7 adding the remainder to a cyclic redundancy code for the
8 prior message to obtain an updated cyclic redundancy code for
9 the updated message.

1 28. The method in claim 27, wherein the moduloing includes
2 multiplying the accumulated-remainder by a reciprocal-
3 approximator for the generator polynomial to obtain the
4 remainder.

1 29. A device which incrementally updates a cyclic redundancy
2 code, comprising:

3 a subtraction unit to subtract a prior message from an
4 updated message to obtain a difference;

5 a modulo unit to modulo the difference by a generator
6 polynomial to obtain a remainder; and

7 an accumulator to add the remainder to a cyclic
8 redundancy code for the prior message to obtain an updated
9 cyclic redundancy code for the updated message.

1 30. The device in claim 29, wherein the subtraction unit
2 includes exclusive-or logic gates.

1 31. A method for incrementally updating a cyclic redundancy
2 code for a message, comprising:

3 subtracting a prior message segment from an updated
4 message segment to obtain a difference-segment;
5 moduloing the difference-segment by a generator
6 polynomial to obtain a difference segment-remainder;
7 multiplying the difference segment-remainder by a
8 segment-constant to obtain an expanded segment-remainder;
9 moduloing the expanded segment-remainder by the generator
10 polynomial to obtain an updated message-remainder; and
11 adding the updated message-remainder to a cyclic
12 redundancy code for the prior message to obtain an updated
13 cyclic redundancy code for the updated message.

1 32. The method in claim 31, wherein moduloing includes
2 dividing by the generator polynomial.

1 33. A device which incrementally updates a cyclic redundancy
2 code for a message, comprising:

3 a subtraction unit to subtract a prior message segment
4 from an updated message segment to obtain a difference-
5 segment;
6 a modulo unit to modulo the difference-segment by a
7 polynomial to obtain a difference segment-remainder;
8 a multiplier to multiply the difference segment-remainder
9 by a segment-constant to obtain an expanded segment-remainder;

10 a modulo unit to modulo the expanded segment-remainder by
11 the polynomial to obtain an difference-remainder; and
12 an accumulator to add the difference-remainder to a prior
13 cyclic redundancy code for the prior message to obtain an
14 updated cyclic redundancy code for the updated message.

1 34. The device in claim 29, wherein the accumulator includes
2 exclusive-or logic gates.

1 35. An article comprising a machine-readable medium that
2 stores instructions to obtain a cyclic redundancy code for a
3 message, the instructions causing a machine to:
4 separate the message into a plurality of segments;
5 multiply a remainder for each segment by a segment-
6 constant based on a generator polynomial to obtain a plurality
7 of segment-remainders;
8 accumulate the segment-remainders to obtain an
9 accumulated-remainder; and
10 modulo the accumulated-remainder by the generator
11 polynomial to obtain the cyclic redundancy code for the
12 message.

1 36. The article of claim 35, further comprising instructions
2 that cause a machine to modulo the segments by the generator
3 polynomial to obtain the remainder for each segment.

1 37. The article of claim 35, further comprising instructions
2 that cause a machine to verify the integrity of the message if
3 the cyclic redundancy code is zero.

1 38. The article of claim 35, further comprising instructions
2 that cause a machine to invalidate the integrity of the
3 message if the cyclic redundancy code is non-zero.

1 39. An article comprising a machine-readable medium that
2 stores instructions to obtain a cyclic redundancy code for a
3 message, the instructions causing a machine to:

4 separate a message into a plurality of segments;
5 multiply each segment by a segment-constant based on a
6 generator polynomial to obtain a plurality of segment-
7 remainders;

8 accumulate the segment-remainders to obtain an
9 accumulated-remainder; and

10 modulo the accumulated-remainder by the generator
11 polynomial to obtain the cyclic redundancy code for the
12 message.

1 40. The article of claim 39, further comprising instructions
2 that cause a machine to apply a field extender to the
3 generator polynomial.

1 41. An article comprising a machine-readable medium that
2 stores instructions to obtain a cyclic redundancy code for a
3 message, the instructions causing a machine to:

4 subtract a prior message from an updated message to
5 obtain a difference;

6 modulo the difference by a generator polynomial to obtain
7 a remainder; and

8 add the remainder to a cyclic redundancy code for the
9 prior message to obtain an updated cyclic redundancy code for
10 the updated message.

1 42. The article of claim 41, further comprising instructions
2 that cause a machine to obtain the remainder by multiplying
3 the accumulated-remainder by a reciprocal-approximator for the
4 generator polynomial.

1 43. An article comprising a machine-readable medium that
2 stores instructions to obtain a cyclic redundancy code for a
3 message, the instructions causing a machine to:

4 subtract a prior message segment from an updated message
5 segment to obtain a difference-segment;

6 modulo the difference-segment by a generator polynomial
7 to obtain a difference segment-remainder;

8 multiply the difference segment-remainder by a segment-
9 constant to obtain an expanded segment-remainder;

10 modulo the expanded segment-remainder by the generator
11 polynomial to obtain an updated message-remainder; and

12 add the updated message-remainder to a cyclic redundancy
13 code for the prior message to obtain an updated cyclic
14 redundancy code for the updated message.

1 44. The article of claim 43, further comprising instructions
2 that cause a machine to modulo by division.

1 45. The article of claim 43, further comprising instructions
2 that cause a machine to modulo by reciprocal approximation.